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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,954	12/01/2003	Ryosuke Usui	14225-035001/F1030610US00	3594

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EXAMINER

BREWSTER, WILLIAM M

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/724,954

Applicant(s)

USUI ET AL.

Examiner

William M. Brewster

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto et al., US Patent No. 6,528,879 B2 in view of Dery et al., US Patent No. 6,074,895.

Sakamoto teaches limitations from claims 1, 2, a circuit device manufacturing method comprising: in fig. 16A, forming separation grooves 101 in a conductive foil 100 from a top surface to form conductive patterns that are integrally connected at the bottom portion of the conductive foil, col. 18, lines 30-63; in fig. 17, mounting a circuit element 105 onto one or more of the conductive patterns; and, in fig. 18, sealing with a resin layer 18 so as to cover the circuit element and fill the separation grooves, col. 19, line 39 - col. 20, line 3; and in figs. 18-21A, wherein a rear surface of the conductive foil is eliminated until the resin layer is exposed at the rear surface of the conductive foil to electrically separate the respective conductive patterns, col. 20, lines 20-41;

limitations from claim 11, the method of claim 1 or 2, in fig. 14, wherein the conductive foil 100 is formed of a metal having copper as the principal material, col. 17, line 66 - col. 18, line 8;

limitations from claim 12, the method of claim 1 or 2, in fig. 17, wherein the circuit element comprises a semiconductor element 105A, that is electrically connected to one or more of the conductive patterns via metal wires 106, col. 19, lines 39-62;

limitations from claim 14, the method of claim 1, in fig. 17, wherein the separation grooves 101 extend only partially through the conductive foil.

Sakamoto (879) does not teach a plasma irradiation, but Dery does. Dery teaches in fig. 1A, limitations from claim 1, wherein plasma is irradiated onto the top surface of the conductive structures, and wherein contaminants attached to side surfaces of the separation structures are removed by ions reflected by the side surfaces, col. 3, lines 21-34, wherein the plasma cloud 116 generates plasma ions emanating from all directions including ones to irradiate the side structures; limitations from claim 2, irradiating plasma onto the top surface of the conductive structures, including the circuit element, col. 3, lines 21-34; and

limitations from claim 3, the method of claim 1, wherein irradiation of the plasma is carried out prior to the step of mounting the circuit element, col. 3, lines 21-34; limitations from claim 4, the method of claim 1, wherein irradiation of the plasma is carried out subsequent to the step of mounting the circuit element, col. 3, lines

21-34, wherein for claims 2-4, the cleaning of the conductive structures and the circuit elements are beneficial giving the practitioner the option to gain advantages of plasma irradiation before and after circuit element attachment; limitations from claim 5, the method of claim 1 or 2, in fig. 1A, wherein contaminants attached to the surfaces of the separation grooves are removed by the plasma, col. 3, lines 21-34; limitations from claim 6, the method of claim 5, wherein the contaminants comprise organic or inorganic matter, inorganic, col. 3, lines 21-34; limitations from claim 7, the method of claim 1 or 2, wherein the surface of the separation grooves are roughened by the plasma irradiation, col. 3, lines 21-34; limitations from claim 8, the method of claim 1 or 2, wherein the surface of the separation grooves are oxidized by the plasma irradiation, col. 3, line 64 - col. 4, lines 9, wherein the oxidizing affects the conductive structures as well; limitations from claim 9, the method of claim 1 or 2, wherein the plasma irradiation is carried out using oxygen gas, col. 3, line 64 - col. 4, lines 9; limitations from claim 10, the method of claim 1 or 2, wherein the plasma irradiation is carried out using an inert gas: argon, col. 3, line 64 - col. 4, lines 9.

Dery gives motivation in col. 3, lines 21-34. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that combining Dery's process with Sakamoto's invention would have been beneficial because it can enhance adhesion between the device surfaces and the encapsulant.

Other Prior Art

Examiner notes with interest, Igarashi et al., US Patent No. 6,889,428 B2 could be a §102(e) reference with an unperfected filing date of the application.

Response to Arguments

Applicant's arguments with respect to claims 1-12, 14 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William M. Brewster whose telephone number is 571-272-1854. The examiner can normally be reached on Full Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2 December 2005
WB

William M. Brewster